

2191 (2002)). In these reports, researchers used the fluorophores (mostly organic laser dyes) to visualize or test the SPR-enhanced interactions. Their studies show that the fluorescence intensity of the fluorophores located nearby metal nanoparticles can be enhanced by a factor as high as 10^4 with one-photon mode of excitation and 10^8 with two-photon mode of excitation, and Raman signal for fluorophores which are in contact with metal nanoparticle can be enhanced by 10^{14} (M. Moskovits: *Rev. Mod. Phys.* 57, 783 (1985); T.L. Haslett, L. Tay, M. Moskovits: *J. Chem. Phys.* 113, 1641 (2000), and references therein; K. Kneipp, Y. Wang, H. Kneipp, L.T. Perelman, I. Itzkan, R.R. Dasari, M.S. Feld: *Phys. Rev. Lett.* 78, 1667 (1997); Gryczynski et al., "Multiphoton excitation of fluorescence near metallic particles: enhanced and localized excitation", *J. Phys. Chem. B*, 106, 2191 (2002)). The observed SPR-enhanced interaction of metal nanoparticles with fluorophores was also associated with intense decomposition of fluorophores when fluorophores were at a distance of 20 nm or less from metal nanoparticles (Ditlbacher H. et al., *Appl. Phys. B* 73, 373-377 (2001)).

The present invention expands the above scientific findings to provides a novel methodology, a new composition, and new applications that are based upon on the surface plasmon resonance (SPR)-enhanced interactions of nanoparticles embedded into a material body with the nearby biological and chemical substances, and with the material body. a new method of a The surface plasmon resonance enhanced interactions of metal nanoparticles with biological substances and/or chemical substances that leads to biochemical/biophysical modifications or destruction of biological substances in the body. Biological substances considered in this invention are: a biomolecule, bacteria, living tissue, cells, virus, human body, animal body, and other living biological species.

In the CLAIM section.

Applicant amended the Claim section in compliance with 37 CFR 1.121. Applicant amended claims 1, 2, 5, 7, 9, 10, 16-20 that find basis in the original specification, and cancelled claims 3, 4, 6, 8, 11-15. No new matter has been inserted into the amended claims. The amended claims and a clean copy of the pending claims are shown on the following pages.

Listing of Claims:

1. (currently amended): A composition comprising:

- a) a nanoparticle;
- b) a substance attached to the nanoparticle or located nearby the nanoparticle; and
- c) a plasmon source.

~~A method and a composition of a plasmon enhanced body treatment and bacterial killing comprises of:~~

- ~~a) Surface plasmon resonance and a metal nanoparticle interacting with a nearby biological substance,~~
 - ~~b) Surface plasmon resonance and a metal nanoparticle interacting with a nearby biological substance and with a nearby chemical agent,~~
 - ~~c) Surface plasmon resonance and a metal nanoparticle interacting with a nearby biological substance in the presence of electromagnetic radiation,~~
 - ~~d) Surface plasmon resonance and a metal nanoparticle interacting with a nearby biological substance and with a nearby chemical agent in the presence of electromagnetic radiation,~~
 - ~~e) A source for generating surface plasmon resonance in the metal nanoparticle,~~
 - ~~f) An electromagnetic radiation source.~~
2. (currently amended): The composition of claim 1, wherein the substance is a biological substance or a chemical substance. ~~The method of claim 1, wherein the biological substance is selected from a group consisting of a biomolecule, tissue, skin, cells, body organs, bacteria, virus, pathogen, biochemical warfare agent, human body, animal body.~~
3. (cancelled): ~~The method of claim 1, wherein the chemical agent is an inorganic molecule, organic molecule, mixture of inorganic and organic molecules, drug.~~

4. (cancelled): ~~The method of claim 1, wherein the chemical agent is hydrogen peroxide.~~
5. (currently amended): The composition of claim 1, wherein the nanoparticle is selected from the group consisting of metal or metallic compound. ~~The method of claim 1, wherein the metal nanoparticle is a metal, metallic salt, electric conductor, electric superconductor, electric semiconductor.~~
6. (cancelled): ~~The method of claim 5, wherein the metal is selected from a group consisting of silver, ruthenium, platinum, rhenium, rhodium, osmium, iridium, copper, zinc, nickel, chromium-magnesium, iron, palladium, gold, titanium, titanium dioxide, silver nitrate, alkaline earth metal, gold, copper, silver oxide, silver ion.~~
7. (currently amended): The composition of claim 1, wherein the nanoparticle is uncoated or coated with a coating selected from the group consisting of a biorecognitive, bioactive, environmentally sensitive, chemorecognitive, chemically active, medically active, coating containing drug, polymer, dielectric or semiconductor. ~~The method of claim 1, wherein the metal nanoparticle is coated with a biorecognitive material, bioactive material, dielectric material, chemorecognitive material, chemical active material, polymer, environmentally sensitive polymer, polymer containing drug.~~
8. (cancelled): ~~The method of claim 1, wherein the metal nanoparticle is not coated with material.~~
9. (currently amended): The composition of claim 1, wherein the nanoparticle has size within a range of 0.1 nm to 20,000 nm in at least one of the nanoparticle's dimensions. ~~The method of claim 1, wherein the metal nanoparticle size is in a range of 1 nm to 20,000 nm in at least one of the dimensions.~~
10. (currently amended): The composition of claim 1, wherein the nanoparticle has a shape or a structure selected from the group consisting of thin film, colloid, fiber, metal island,

shell or nanowire. ~~The method of claim 1, wherein the metal nanoparticles is a thin film, colloid, fiber, metal island, nanowire.~~

11. (cancelled): ~~The method of claim 1, wherein a distance of the surface plasmon resonance enhanced interaction is from the metal nanoparticles (0 nm) up to 10,000 nm.~~
12. (cancelled): ~~The method of claim 1, wherein the electromagnetic radiation source is selected from a group consisting of a laser with single wavelength, laser with plurality wavelengths, laser diode, light emitted diode, lamp, bioluminescence, sunlight, chemiluminescence, electroluminescence, metal nanoparticle luminescence.~~
13. (cancelled): ~~The method of claim 1, and 12, wherein the electromagnetic radiation source is a single wavelength source of polarized or unpolarized light with wavelength between 200 nm to 10,000 nm,~~
14. (cancelled): ~~The method of claim 1, and 12, wherein the electromagnetic radiation source is plurality wavelengths source of polarized or unpolarized light with wavelengths between 200 nm to 10,000 nm.~~
15. (cancelled): ~~The method of claim 1, wherein the surface plasmon resonance is generated by electromagnetic radiation in a single-photon mode of excitation, multi-photon mode of excitation.~~
16. (currently amended): The composition of claim 1, wherein the composition is used in body treatment, body health prevention, cosmetic treatment, anti-bacterial treatment, anti-virus treatment, anti-odor treatment, anti-cancer treatment or sun related prevention treatment. ~~The method of claim 1, wherein the body treatment is a joints treatment, tissue treatment, cosmetic treatment, cosmetic prevention, rejuvenating treatment, therapy treatment, bacterial disease treatment, antibacterial treatment, virus treatment, cancer~~

~~treatment, biostimulation treatment, antiodor treatment, sun prevention treatment, sunburn treatment, skin burn treatment, wound treatment, antiinflammation treatment.~~

17. (currently amended): The composition of claim 16, wherein the composition is placed at a specific location in/on the body and remain in the location during treatment. The ~~method of claim 1, 7, and 8, wherein the body treatment is performed at a specific location in the body, where said the metal nanoparticle remains in the location for the body treatment.~~
18. (currently amended): The composition of claim 1 is further provided with at least one additional type of plasmon source or with at least one additional substance. ~~The method of claim 1, wherein the surface plasmon resonance enhanced body treatment and bacterial management is additionally enhanced by the nearby presence of electromagnetic radiation, the chemical agent, electromagnetic radiation and the chemical agent.~~
19. (currently amended): The composition of claim 1, wherein the composition is additionally used in a device or a product that benefiting body health or bacterial management. ~~The method of claim 1, wherein bacterial killing is applied to: air conditioning and heating system, air humidity control system, air ventilation system, disinfectant product, antiseptic product, water supply line, water container, septic tank, bathtub, whirlpool, Jacuzzi, swimming pool, dental waterlines, food technology, animal food technology, household cleaning product, kitchen product, product for pets, cosmetic product, hygiene product, medical bio-safety product, hair product, laundry product, textile material, pharmaceutical product for human, pharmaceutical product for animal, health supplement product, drinking water product, beverage product, paint product, biodefense product, furniture preserving product, art preserving product, sunburn protection product, sun-tanning technology.~~

20. (currently amended): The composition of claim 1, wherein the plasmon source is selected from the group consisting of electromagnetic, sonic, electric, magnetic, thermal, or ionic radiation. ~~The method of claim 1, wherein the source for generation surface plasmon resonance in the metal nanoparticle is electromagnetic radiation, sonic wave technologies, electrical technologies, magnetic technologies, radiation technologies.~~